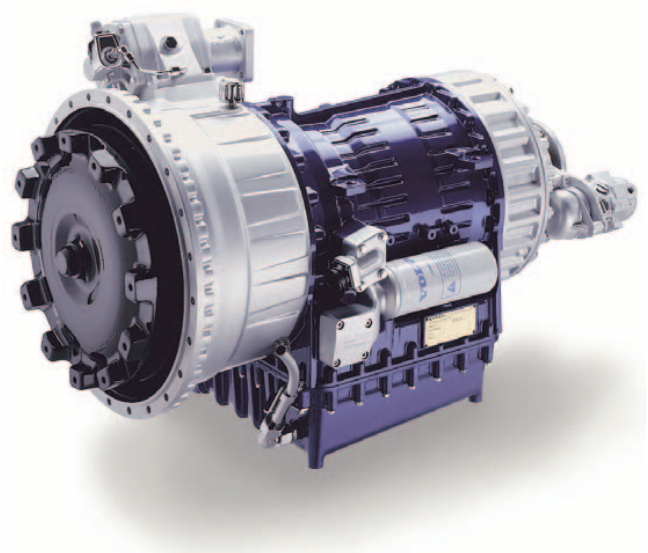
Fact Sheet

Gearbox
Powertronic V2206PT

The V2206PT (VT2206PT, GSS-PS) is a 6-speed, fully automatic gearbox designed for an engine torque of 2200 Nm.

The fully automatic Powertronic V2206PT shifts with no interruption in power (power-shift). The gearbox also offers the option of manual gear shifting. In the manual mode, the driver shifts up or down with a rocker switch on the gear lever.
The V2206PT consists of a hydraulic torque amplifier with lock-up, a number of planetary gears with brakes, disc clutches that lock the different parts of the planetary gears, and an electronically controlled regulating system that monitors and regulates the shifting function. The gearboxes' control modules are integrated into the trucks electronic system.
The hydraulic torque amplifier boosts the engine's torque, which provides the truck with excellent power when moving off from a standstill. The torque amplifier absorbs sudden loads in the driveline when starting off, and it is fitted with an automatic direct lock-up which, after starting off, locks the turbine- and pump wheels to each other. The direct lock-up, which is engaged in all gears, offers a high degree of efficiency, low fuel consumption, and low operating costs.
The range of ratios for the V2206PT offers the lowest gear with high power when moving off, while the highest gear, which is a direct drive gear (1:1), offers very good fuel economy for motorway driving. The Powertronic V2206PT is adapted for heavy-duty transport such as construction driving and for driving in city areas, with numerous starts and stops.



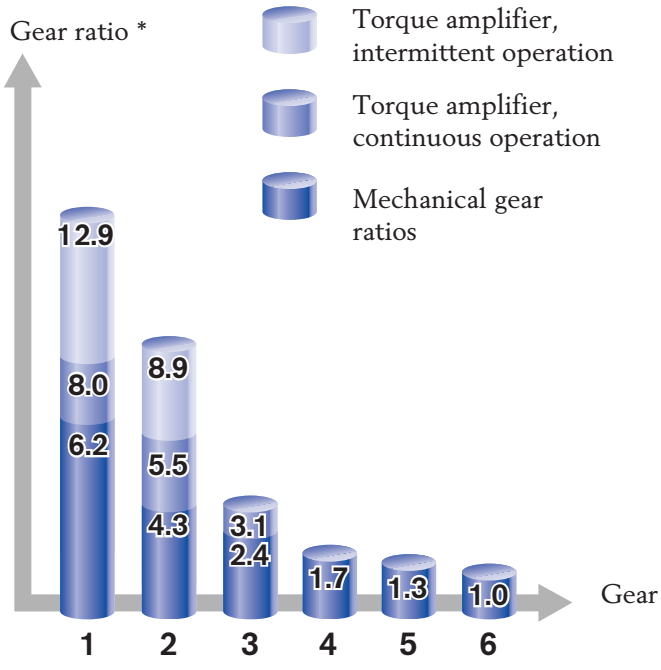
The gearbox pictured is fitted with a power take-off (option) and an extra steering servo pump

The following product features characterise the V2206PT:

- Gear shifting takes place with no power interruption, in both automatic and manual gear shift modes
- Good starting-off capability, even in difficult driving conditions.
- Possibility of selecting the gear shift program adapted to current driving conditions.
- Automatic direct lock-up in all gears.
- Electronic control of the gearbox, with advanced capacity for diagnostics and fault tracing.
- Option of an integrated retarder.
- Option of fitting an engine-dependent power take-off.

Specification

Type designation	VT2206PT, GSS-PS
Weight without oil	460 kg
Type	Automatic planetary gearbox
Max. torque	2200 Nm
Number of forward gears	6
Reverse gears	2
Gear ratios:	
1st	6.154:1
2nd	4.269:1
3rd	2.408:1
4th	1.675:1
5th	1.322:1
6th	1.00:1
Reverse 1	6.637:1
Reverse 2	3.844:1
Max. ratio in the torque amplifier depending on engine alternative	2.09:1/2.36:1
Gear lever positions:	
R	Reverse
N	Neutral
A	Automatic gear shift mode
M	Manual gear shift mode
Driving programs:	
E	Economy program
P	Performance program (full output)
Oil change volume including oil cooler	ca 32 l



* With the torque amplifier gear ratio alternative 2.09:1

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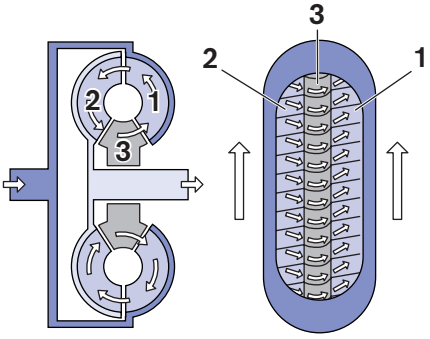
Direct coupling provides high efficiency and low fuel consumption

The power from the engine is transmitted to the automatic gearbox via a torque amplifier.
In the torque amplifier, the engine's power is boosted smoothly when a pump wheel (1), which is powered by the engine, presses oil with a centrifugal pump toward a turbine wheel (2). When the flow of oil reaches the turbine wheel, it begins to rotate and thereby transmits power to the gearbox. A guide wheel (3), carried on a free-wheel, is located between the pump wheel and the turbine wheel. In the one direction of rotation, the guide wheel is locked to the gearbox housing, while it rotates in the other direction. The purpose of the guide wheel is to direct the flow of oil from the turbine wheel back into the pump wheel, at an angle that is as favourable as possible for the pump wheel. The greater the difference in speed between the pump wheel and the turbine wheel, the greater the torque amplification and counter-force on the guide wheel.
When the vehicle's speed increases, the pump wheel and turbine wheel rotate at nearly the same speed and the guide wheel is no longer locked to the gearbox housing and also rotates. At this stage, there is no torque amplification. To avoid power losses, the pump wheel is locked mechanically to the turbine wheel with a direct lock-up. In this way, a high degree of efficiency and low fuel consumption are achieved.



Torque amplifier with pump wheel (1), turbine wheel (2) and guide wheel (3)

Exact control via the truck's electronic system

The V2206PT is integrated with Volvo's vehicle electronics via the gearbox control module and the gear selector control module, which means that the gearboxes' functions are controlled fully electronically. The truck's electronics provide advanced possibilities for diagnostics and fault tracing. The information is presented on an easy-to-read display on the instrument panel, or via an externally connected PC.

The graphic display shows the driving program, available gears down, gear lever position, available gears up, and the selected gear

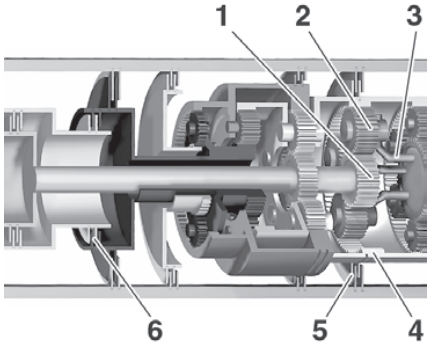
High efficiency with the integrated hydraulic primary retarder

The Powertronic V2206PT can be supplied with an integrated hydraulic primary retarder. The retarder improves performance considerably by enabling driving at higher average speeds without sacrificing safety in any way. The primary retarder also increases efficiency since it provides high braking effectiveness even at low speeds, and allows for the brakes to be engaged even as gear shifting is taking place.
Since most of the braking work can be done with assistance from the retarder, service and repair costs on the wheel brakes are reduced, thereby increasing the truck's profitability.
Type designation ..... RET-TPT
Max. engine speed ..... 2400 r/min
Max. braking torque ..... 1500 Nm
Max. braking effect combined with exhaust brake
D9 ..... approx. 540 kW*
D12 ..... approx. 560 kW*
Weight ..... 22 kg

* in the case of continuous operation, effect is reduced when water- and oil temperature increase.

Compact and maintenance-free planetary gear system provides high operating reliability

Power from the torque amplifier is transmitted to the gearboxes' planetary gear system. This consists of five planet gears and a number of hydraulically controlled disc clutches and brakes. The disc clutches and brakes, which are oil-cooled, are connected to the planet gears in such a way that they control the function of the planet gears.
The planetary gear consists of a sun wheel (1), planet wheels (2), a planet wheel retainer (3) and an outer ring wheel.
By allowing certain parts of the planetary gear to rotate and locking other parts with the brakes (5) and disc clutches (6), different gear ratios can be achieved.



Planetary gear with sun wheel (1), planet wheel (2), planet wheel retainer (3), ring gear (4), brake (5) and disc clutch (6)

Prepared for fitting a reliable power take-off

A power take-off is available for the V2206PT gearbox, adapted for directly fitted hydraulic pumps or propeller shaft operation. The power take-off is driven directly from the engine via the torque amplifier and due to its design with a hydraulically controlled disc clutch can be engaged or disengaged while driving, resulting in high efficiency.

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